Lal, R. (ed.): **Soil Carbon Sequestration and the Greenhouse Effect.** – Soil Science Society of America, Madison 2001. ISBN 0-89118-836-3. xvii + 236 pp., USD 66.00.

The impact of global climate change on biosphere became one of the greatest problems of the recent world. The numerous analyses of global carbon budget have shown that terrestrial ecosystems in general, but world soils in particular, play an important role in the global carbon cycle.

The reviewed SSSA Special Publication Number 57 is based on contributions presented to a symposium organised at the annual meeting of the Soil Science Society of America held in Baltimore, MD, on 20 October 1998. This volume, comprising 16 chapters written by 42 scientists from the USA, Canada, and Brazil, includes research information on soil carbon sequestration from croplands, range lands, grazing lands, forest lands, and set-aside or Conservation Reserve Program (CRP) lands in the USA and Canada. A unique feature of this book is inclusion of up-to-date information on soil organic carbon and soil inorganic carbon, agricultural soils and forest soils, and soil organic carbon dynamics in CRP land vis-a-vis the natural ecosystems.

Although the book is focused on soil carbon sequestration under conditions of global climate change, the readers of Photosynthetica can find much information useful for plant scientists interested especially in ecophysiology, and plant and ecosystem functioning in changing climate. Rattan Lal, the editor of the book, deals in the first two chapters with general aspects of greenhouse effect and soils, and presents some basic data on this problem: Atmospheric concentration of carbon dioxide and other greenhouse gases ($N_2O$, $CH_4$, *etc.*) has increased steadily since the on-set of the Industrial Revolution around 1850, and reached about 0.727 g $m^{-3}$ (370 $cm^3$ $m^{-3}$) in 2000. The present rate of enrichment of atmospheric $CO_2$ is $3.3\times10^{12}$ kg C per year. Three principal sources of the atmospheric increase in carbon dioxide concentration include fossil fuel combustion, deforestation and soil cultivation, and industrial manufacture of cement and fertiliser/lime materials. World soils comprise the third largest among active global carbon pools ($1\ 550 \times 10^{12}$ kg of organic carbon and $750 \times 10^{12}$ kg of inorganic carbon to 1-m depth), which is 3.2 times the atmospheric carbon pool ($720 \times 10^{12}$ kg) and 4.1 times the biotic pool ($560\times 10^{12}$ kg). The soil organic carbon (SOC) pool has lost about 66 to $90\times10^{12}$ kg C to the atmosphere due to conversion of natural to agricultural ecosystems and soil cultivation. Most agricultural soils have lost 25 to 75 % of their origi-nal pool, and severely degraded soils have lost 70 to 80 % of the antecedent pool. Restoration of eroded and de-graded soils, and adoption of recommended agricultural practices can lead to sequestration of 60 to 80 % of the historic soil carbon loss. Beside this, there is also some potential for sequestration of soil inorganic carbon by formation of secondary carbonates and leaching of carbonates in the groundwater.

Also further chapters present original data and approaches interesting for readers of Photosynthetica: photosynthesis and respiration in pastures, biomass production and distribution, models and assumptions for monitoring carbon flux, possibilities of mitigation of the greenhouse effect, *etc.* The other chapters are devoted to soil carbon sequestration and other traits under CRP in the historic grassland soils, on cropland and grassland, in prairie, in agroecosystems, *etc.* The last chapter "The response of soil science to global climate change" concludes the volume presenting several researchable issues with regards to soil carbon sequestration that need to be addressed for principal soils and ecoregions.

The book is well edited and produced, and is accompanied with a detailed list of conversion factors for SI and non-SI units. Abundant schemes, tables, and figures make the book self-explanatory. Individual chapters present together more than 650 references mainly to American literature. However, the readers would surely welcome even a short subject index. I am convinced that the book will be welcome by plant and soil scientists, teachers, and graduate students interested in interdisciplinary approach to environmental sciences, and global climate change.

J. ČATSKÝ (*Praha*)